

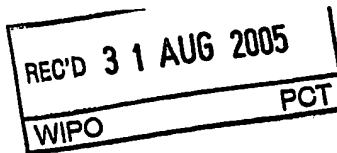
# PATENT COOPERATION TREATY


# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference PC531GQ	<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/EP2004/011476	International filing date (day/month/year) 13.10.2004	Priority date (day/month/year) 14.10.2003	
International Patent Classification (IPC) or national classification and IPC H02K21/24, H02K1/14, H02K29/08, H02K3/52, H02K11/04			
Applicant EMERSON APPLIANCE MOTORS EUROPE S.R.L.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 1 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand  12.05.2005		Date of completion of this report  01.09.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer  Contreras Sampayo, J  Telephone No. +31 70 340-4343	



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/011476

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-9 as originally filed

**Claims, Numbers**

2-9 as originally filed

1 as amended (together with any statement) under Art. 19 PCT

**Drawings, Sheets**

1/7-7/7 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
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International application No.  
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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-9
	No: Claims	
Inventive step (IS)	Yes: Claims	1-9
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-9
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

Reference is made to the following document:

D1: US 2002/149285 A1 (TSO-KUO YIN ET AL) 17 October 2002 (2002-10-17)

1. Document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and shows (the references in parentheses applying to this document):

a rotary electrical machine (Fig. 4) with a rotor (6) with a permanent magnet (65) for producing an annular distribution of magnetic polarities (N, S) of angularly alternating sign about the axis of rotation of the rotor (6), within a magnetized surface lying in a plane perpendicular to said axis of rotation and a stator (7) that includes: a flow-conveying structure (72) formed of magnetically conductive material (paragraph [0029]), said structure has an annular base portion (7) from which the first and second arms (71, 72) extend parallel to the axis of the rotor, said arms being situated essentially at a first and a second radial distance, respectively, from said axis and angularly alternating with respect to each other (fig 4); the ends of said first and second arms opposite to the base portion (7) frontally face said magnetized surface (65) of the rotor (6) from which they are separated by an air-gap; and a winding (4) arranged coaxially with the rotor, in an annular region lying between said first and second arms (71, 72) of the flow conveying structure.

The difference between the prior art as defined by the teachings of D1 and claim 1 are the following features:

- a)- the flow-conveying structure is formed as one piece with a pressure-shaped mass of insulated ferromagnetic particles
- and
- b)- the ends of said first and second arms have terminal surfaces which are inclined all a same direction with respect to a plane transverse to said axis

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problems to be solved by the present invention may be regarded as:

allow a torque of a predetermined value to be produced by the machine upon start-up.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

as a consequence of the inclination of the terminal surfaces of the arms of the stator that face the rotor the air gap between them and the rotor varies cyclically in amplitude. This allows the stator and rotor to rest in a predetermined position upon stoppage of the machine and ensures the generation of a torque of sufficient magnitude upon start-up.

2. Claims 2-9 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3. The amendment of the independent claim by the addition of the feature "the ends of said first and second arms have terminal surfaces which are inclined all a same direction with respect to a plane transverse to said axis" is not deemed to introduce new subject matter beyond the original disclosure (Article 19(2)/Article 34(2)(b) PCT) because it was originally disclosed in the description (page 6 lines 12-19 and figure 7 of the drawings).

[20] 13

CLAIMS

1. Rotary electric machine (1) comprising:

a rotor (2) with at least one permanent magnet (5), for producing an annular distribution of magnetic polarities (N, S) of angularly alternating sign about the axis of rotation (A-A) of the rotor (2), within a magnetized surface (5) lying in a plane essentially perpendicular to said axis (A-A), and a stator (3) including:

a flow-conveying structure (16) having an annular base portion (17) from which first and second arms (18; 19) extend substantially parallel to the axis of the rotor (A-A), said arms being situated essentially at a first and a second radial distance, respectively, from said axis (A-A) and angularly alternating with respect to each other; the ends (18a; 19a) of said first and second arms (18, 19) opposite to the base portion (17) frontally facing said magnetized surface (5a) of the rotor (5) from which they are separated by an air-gap (21); and

a winding (23) arranged coaxially with the rotor (2), in an annular region lying between said first and second arms (18; 19) of the flow-conveying structure (16);

characterised in that said flow-conveying structure (16) is formed as one piece with a pressure-shaped mass of insulated ferromagnetic particles, and in that the ends of said first and second arms (18, 19) thereof have terminal surfaces (18a, 19a) which are inclined all in a same direction with respect to a plane transverse to said axis (A-A).

2. Rotary electric machine according to Claim 1, in which the overall number of said first and second arms (18, 19) of the flow-conveying structure (16) is equal to the number of the magnetic polarities (N, S) produced on said surface (5a) of the rotor (5).